# How can Learning about the Structure of Research Articles Help International Students?

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## Abstract

*The number of international students coming to Australia or New Zealand to obtain higher degrees is on the increase. Few of them, however, had their research published in scholarly journals during their study. Evidence from research into professional academic writing has indicated that many non-native speaking researchers have difficulty getting their work published in English. One of the problematic areas, as pointed out by Flowerdew (2001), is the structure of the article. Although there have been a considerable number of studies on academic writing in general and this research genre in particular, previous research tended to focus on the structure of only one or two sections of the article, especially the introduction section. Yet, it is important to understand the complete rhetorical structure of the research article. It is therefore the aim of the present study to investigate the rhetorical structure of research articles as a whole, from the abstract through to the conclusion of the article. The data comes from a corpus of 40 published articles in applied linguistics and educational technology. The findings show some interesting differences in the structure of different sections and also differences between the two disciplines. Such knowledge of the structure of research articles will empower international students and help them integrate better into the academic world.*

**Keywords:** rhetorical structure, research articles, academic writing, international students

## Introduction

Recent years have seen an increasing number of international students coming to Australia and New Zealand to study for a Masters or Doctoral degree. Quite a few of these students are teachers of English in their own country. They come to Australia and New Zealand to further their study in Education or Applied Linguistics as these are English-speaking countries. Yet, many of them completed their study without any papers published in international scholarly journals. Such a problem has been investigated by many researchers in the field of professional academic writing (e.g. Burrough-Boenisch, 2003; Cho, 2004; Flowerdew, 1999; Gosden, 1992; Lillis & Curry, 2006; Misak, Marusic, & Marusic, 2005; Pagel, Kendall, & Gibbs, 2002; Sionis, 1995). These studies have revealed some interesting findings. For example, Flowerdew (2001) interviewed editors from eleven international journals in English language teaching and found that the most problematic errors made by non-native speakers were not surface language errors such as article use or subject-verb agreement. One of the main problems that put the non-native speaking author at a disadvantage as compared to their native speaking peers was the inappropriate structure of the introduction/literature review and the discussion/conclusion sections of the research article (Flowerdew, 2001). Realizing the difficulties that non-English speaking authors have is important. Yet, what is equally, if not to say more important, is how they should write their paper. An investigation of the rhetorical structure (i.e. how to structure a research article) of current research articles written in English and published in prestigious international journals will, therefore, provide information which will assist non-native speakers in writing more acceptable papers.

In fact, there have been a considerable number of studies on the structure of research article in the past two decades, especially after Swales's (1990) introduction of the *Create A Research Space (CARS)* model, for example, Posteguillo's (1999), Samraj's (2002b), or Yang and Allison's (2004) studies. These studies have provided significant knowledge of the research article genre. However, research on the structure of research articles has tended to concentrate on only one or two individual sections of the article, especially on the Introduction section (Golebiowski, 1999; Samraj, 2002b; Swales, 1981; Swales & Najjar, 1987) and, to a lesser extent, on the Discussion section (Dudley-Evans, 1997; Holmes, 1997; Peacock, 2002). There have also been a number of studies on the structure of the Abstract of the article (e.g. Anderson & Maclean, 1997; Busch-Lauer, 1995a, 1995b; Huckin, 2001; Pho, 2008; Samraj, 2002a). However, very few studies investigate the organizational structure of other sections of the article, for example, the Methods section (Lim, 2006) and the Results section (Brett, 1994) or of the research article as a whole (with all the main sections of the article:

Introduction – Methods – Results – Discussion) (Kanoksilapatham, 2005; Posteguillo, 1999). The unequal attention to the different sections of the research article may be due to the fact that Swales (1990) provides more detailed models for the Introduction and Discussion sections. Yet, as argued by Kanoksilapatham (2005), it is important to understand the complete rhetorical structure of the research article.

Another gap in previous studies on the research article is that the "hard sciences" have received much more attention than the "soft sciences" from researchers of the research article genre. Disciplines of natural sciences or "hard sciences" investigated in previous studies include, to name just a few, medicine (Nwogu, 1990, 1997; Salager-Meyer, 1990, 1992; Williams, 1999), biochemistry (Kanoksilapatham, 2003, 2005; Thompson, 1993), computer science (Posteguillo, 1999), and engineering (Koutsantoni, 2006). Different disciplines in the fields of social sciences and humanities have also been studied, though to a much lesser extent, for instance, sociology (Brett, 1994), psychology (Hartley, 2003), literature (Balocco, 2000), management (Lim, 2006), linguistics (Lorés Sanz, 2004), and applied linguistics (Santos, 1996; Yang & Allison, 2003). Some studies such as Hyland (2004) and Peacock (2002) have also attempted to compare the rhetorical structure of sections of research articles or research article abstracts across disciplines. However, no studies have compared the rhetorical structure of the research article as a whole (the abstract and the main research article) across disciplines.

Yet, as noted by Swales (1990) and Hyland (1999), rhetorical structures vary according to academic disciplines. Samraj (2002b) goes further by suggesting that there is variation even between related genres. Very necessary therefore is research on rhetorical functions in research articles in the "soft sciences" fields and across related disciplines. The present study thus aims at identifying the prototypical structure of the whole research article in two disciplines – applied linguistics and educational technology – from the Abstract through to the Conclusion of the article. These two disciplines were particularly chosen for the present study for two reasons. Firstly, the disciplines of applied linguistics and especially educational technology appear to be underresearched compared to scientific disciplines. Secondly, these two disciplines are relevant to most English teachers who are non-native speakers.

## Methods

### The construction of the corpus

The study is based on a corpus of 40 empirical research articles randomly selected from four journals in the areas of applied linguistics and educational technology: 10 from *The Modern Language Journal (MLJ)* and 10 from *TESOL Quarterly (TQ)* in the field of applied linguistics, and 10 from *Computers & Education (CE)* and 10 from the *Journal of Computer Assisted Learning (JCAL)* in the field of educational technology. These journals were chosen as they have high impact factors according to Journal Citation Reports (2007). The two journals *MLJ* and *TQ* are the highest ranked in the subfield of language learning and teaching, while the two journals *CE* and *JCAL* are the highest ranked in the subfield of computing technology in learning and teaching. All of the papers were published in 2006 and 2007. As all the four journals are internationally recognized refereed journals, it was assumed that the papers published in these journals were up to a certain standard and thus it was not necessary to select only research articles written by native English-speakers.

### Analysis procedures

The study used a top-down approach to identify the moves and steps in the articles, that is, based on the function or content of the text. It drew on models of move structure in previous studies on various sections of the article in different disciplines. These models were then refined based on the data of the present study.

Although the identification of moves based on function or content can be criticized for its subjectivity, this problem can be dealt with by obtaining high inter-rater reliability rates as suggested by Crookes (1986). All the articles were coded by the author and another coder who is a PhD student in Linguistics. High inter-coder reliability rates were achieved.

## Findings and discussion

### Move structure of the Abstract

Most of the abstracts in the corpus have four to five moves. A closer look at the occurrence frequency of the moves in the corpus revealed that all the abstracts from the two disciplines contain the *Presenting the research (PTR)* move, the *Summarizing the findings (STF)* move and the *Describing the methodology (DTM)* move (see Figure 1 below).
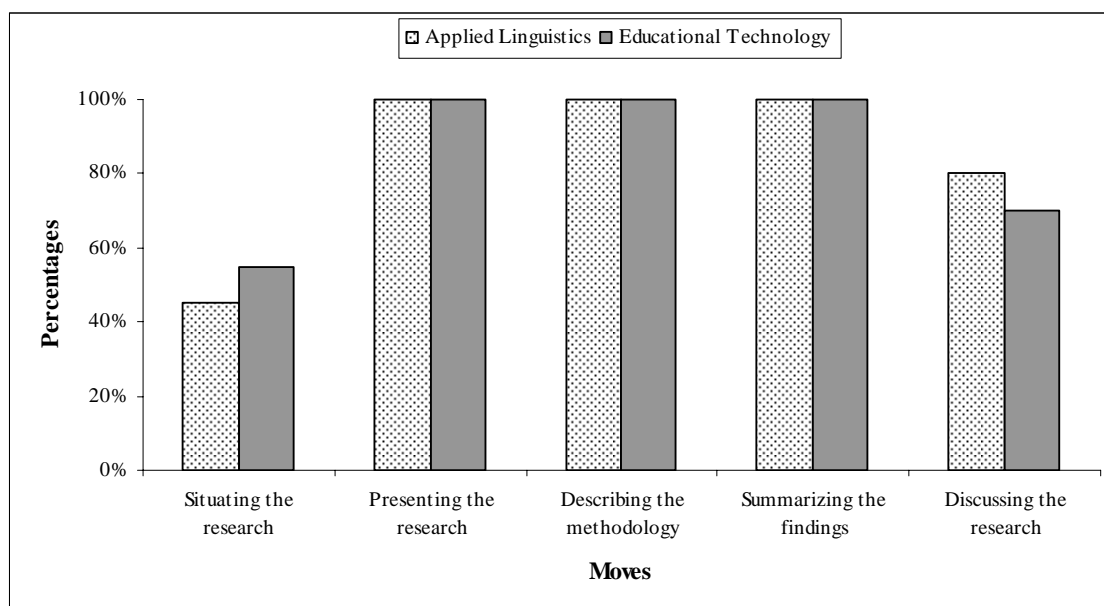
*Figure 1: Frequencies of moves in the Abstract*

As can be seen in the above table, only about half of the abstracts find it necessary to situate the research in the broader field. Thus, Hyland's (2004) suggestion that there is an increasing trend of the appearance of *Situating the research* moves in abstracts is not apparent in this study of applied linguistics and educational technology abstracts. Most of the abstracts adopt a direct approach by presenting what the current study is about, i.e. the *Presenting the research* move. A typical abstract from the corpus is presented below:

    *<Presenting the research>*
        This paper discusses findings from an extensive project examining gender, language and computer-mediated communication (CMC) in the context of undergraduate psychology courses.
    *<Describing the methodology>*
        The contributions of 197 introductory psychology students (148 females, 49 males) participating in asynchronous CMC as part of their course were collated and coded for their language content using a qualitative content analysis procedure in Atlas.ti 4.2. Nearly 700 postings were characterized according to gender on the basis of seven categories relating to language and communication style – attenuated, authoritative, traditional male and female language features, mixed language, positive socioemotional and negative socioemotional. Gender interactions were analyzed in terms of positive and negative socioemotional content, focusing on explicit markers of agreement and disagreement.
    *<Summarizing the findings>*
        Gender-related patterns in language use and interaction style were found. Females were more likely than males to make attenuated contributions and express agreement, whereas males were more likely than females to make authoritative contributions and express disagreement.
    *<Discussing the research>*
        These results are discussed in terms of the implications for the increasing use of CMC in education.
    [ET_JCAL2]

An interesting feature of the Abstract, which is somewhat exclusive to this genre, is that a sentence can express two or three functions at the same time, as illustrated in the following extract:

    *<Presenting the research – Describing the methodology>*
        This article investigates from an acquisitional approach the development of pragmatic competence by novice learners of second language (L2) Spanish.
    [AL_MLJ1]

Moves with two different textual functions like the above sentence were coded as dual moves. The fairly high number of dual coded moves in the abstract can be explained by the condensed nature of the abstract. The authors try to summarize the article in as few words as possible. The most common dual moves found in the corpus are *Presenting the research – Describing the methodology* moves; there are nine such cases in the applied

linguistics abstracts and six in the educational technology abstracts. It seems that it is easier for the author to present what the study is about and at the same time mention the approach or the subjects of the study.

The fact that the three moves – *Presenting the research, Describing the methodology,* and *Summarizing the results* – are always present in the corpus suggests that non-native speakers should include at least these three moves in the Abstract when they are writing papers in either Applied Linguistics or Educational Technology. The *Discussing the research* should also be included if they are writing a paper in Applied Linguistics. In addition, they should learn to combine two moves in one sentence in the Abstract, especially the *Presenting the research* move and the *Describing the methodology* move.

## Move structure of the Introduction section of the main article

All of the three moves in the initial framework for the Introduction section occur frequently in both disciplines. All of the Introductions have an *Establishing a territory* move (i.e. reviewing existing studies and establishing what is already known about the topic) and a *Presenting the present work* move (i.e. announcing what the current study is about). The *Establishing a niche* move (i.e. indicating a gap in previous studies) was also found in more than 80% of the articles. These three functions can thus be said to be very frequent moves in this section. Thus, this finding shows that the move structure of the Introduction in Applied Linguistics and Educational Technology fits in with Swales's (2004) model. It should be noted, however, that such similarity is at the move level rather than at the step level, as pointed out below.

The most common strategies or steps that authors use to establish a territory are *Summarizing existing studies* and *Drawing inferences from previous studies.* Authors from both disciplines tend to report findings from previous studies and then discuss or interpret them to give the readers some background information of the study and to indicate the importance of the field. Sometimes, at the end of this *Establishing a territory* move, the authors give an outline of the structure of the Introduction section, but this strategy was only found in a few articles in Applied Linguistics and not at all in the Educational Technology introductions. An abbreviated *Establishing a territory* move from an Applied Linguistics introduction is given below:

    *<Establishing a territory>*

        <Summarizing existing studies>

            Since the 1970s, many studies have focused on learning with illustrated documents. Globally, these studies have shown that the addition of an illustration to a text significantly improves memorization performance (Levie & Lentz 1982) …

        <Drawing inferences from previous studies>

            The various studies presented above suggest that the restoration of the explicit links between the text and the illustration helps improve the quality of the mental representations generated by the use of an illustrated document …

    [ET-JCAL3]

It should be noted that the steps or strategies listed for the *Establishing a territory* move as presented above have been newly added for the present study. The only strategy or step listed in Swales's (2004) revised *CARS* model is *Topic generalizations of increasing specificity.* However, I found that more detailed strategies can be specified for this move based on the corpus of the present study, and the knowledge of how this move can be realized will be useful to novice writers.

Unsurprisingly, the most common strategy that authors use to 'establish a niche' is *Indicating a gap* (i.e. stating what has not been done in the field). Sometimes the authors present a justification as to why the gap has to be filled. The steps for this move are in line with those listed in Swales's (2004) model. The following extract shows how the author established a niche in the field:

    *<Establishing a niche>*

      …

        <Indicating a gap>

            In sum, research on the effect of discipline-related knowledge on EAP reading comprehension has failed to come up with a clear relationship between discipline-related knowledge and increased comprehension. So far, only a few studies, not without methodological shortcomings, have addressed the compensatory effect of discipline-related knowledge and English-language proficiency on EAP reading.

        <Presenting positive justification>

            Clearly, these are issues that deserve to be investigated more thoroughly.

    [AL_MLJ4]

As for the last move of the Introduction section, *Presenting the present work*, a strategy that is almost always used to realize this move is *Announcing present research descriptively and/or* purposively. In this step, the authors present their own study, what they are aiming to do or what it is about. This finding is similar to

Swales's (2004). However, unlike Swales, this study found that the *Presenting research questions or hypotheses* step is also commonly used by authors in Applied Linguistics and Educational Technology to present their work, although it is more so in the former discipline than in the latter (with its presence in 18 and 14 out of the 20 articles in each discipline respectively). On the other hand, Educational Technology authors tend to mention the methods used in their study in the Introduction more than those in Applied Linguistics (in 14 and 8 articles respectively). It seems that mentioning the methods of the study is more important in the introduction section in Educational Technology articles than in Applied Linguistics ones. The authors sometimes define special terms or state the value of their study in the Introduction section, but this applies more to Applied Linguistics than to Educational Technology. Likewise, authors seldom announce the outcomes of the study or outline the structure of the study in the Introduction section. The example below shows how the author presents his own work:

> *<Presenting the present work>*
>> <Announcing present research descriptively and/or purposively>
>>> Thus, the purpose of the present study was to examine the effects of four different forms of listening support on listening comprehension of EFL college students at two listening proficiency levels. The four types of support were topic preparation (TP), vocabulary instruction (VI), repetition of the input (RI), and preview of the questions (PQ).
>> <Drawing inferences from previous studies>
>>> Specifically, the research addressed the following questions:
>>> • Will different types of listening support affect learners' listening performance differently? If yes, which type of support will lead to a higher level of comprehension?
>>> • Will the effects of each form of listening support be the same for learners at two levels of L2 listening proficiency?
> [AL_TQ6]

These common strategies in the two disciplines should be brought to students' attention in academic writing courses, so that they can make sure that these are included in their paper in a particular discipline.

## Move structure of the Methods section of the main article

As mentioned earlier, unlike the Abstract or the Introduction section, the Methods section of the research article seems to be underresearched. Thus, the findings presented below can be of importance to novice writers in writing their papers.

Interestingly, the description of the data collection procedure is more common than the description of the data analysis procedure. In fact, whereas all the Methods sections in both disciplines contain the *Describing data collection procedure* move, only 70% of the articles in Educational Technology describe how the data is analyzed as compared to 85% of their Applied Linguistics counterpart. However, both of these moves can be considered prototypical moves of the Methods section for the two disciplines in the present study.

In describing the data collection procedure, the authors almost always describe the sample (for example, the participant of the study) and the research instruments such as the questionnaire, interview or tests used in the study. They also often describe the actual steps in data collection (19 versus 17 articles in the disciplines of Applied Linguistics and Educational Technology, respectively). As for the second move – *Describing data analysis procedure*, the most common strategy used by the authors to realize this move is *Recounting data analysis procedure* (describing how the data was dealt with after being collected).

Interestingly, Applied Linguistics articles tend to give justification for the methods used more frequently than educational technology ones, though not as frequently as the other steps mentioned above. While 16 out of 20 articles in the former discipline contain at least one *Justifying the data collection procedure* step, only 8 out of 20 articles in the latter discipline have this step. The same pattern is found for the *Justifying the data analysis procedure* step of the second move, although at a lower frequency rate than the justification step for Move 1, with 7 out of 17 articles in applied linguistics and 4 out of 14 articles in educational technology containing this step. The following extract illustrates the most common strategies used to realize the moves in the Methods section:

> *<Describing data collection procedure>*
>> <Describing the sample>
>>> Initial participants in the study were 236 non-native adult learners of Chinese enrolled in first-to fourth-year Chinese classes at nine U.S. colleges and universities …
>> <Describing research instruments>
>>> Four tests were developed for the purpose of data collection: a radical perception test, a radical knowledge test, a radical knowledge application test, and a vocabulary test …
>> <Justifying data collection procedure>

We included the first-year participants to help determine at what point learners develop the idea of decomposing a compound character into radicals rather than perceiving it as a whole or a pile of strokes …

<Describing data analysis procedure>

    <Recounting data analysis procedure>

        To ensure accuracy of measurement, we conducted a reliability analysis for consistency of measurement of the aforementioned four tests — the split half reliability analysis was applied to all four tests …

[AL_MLJ5]

## Move structure of the Results section of the main article[*]

The Results section is also one of the sections of the article that have been little researched. Like the Methods section, the Results section of the Applied Linguistics articles tend to be more elaborate than those in Educational Technology. Although all the Results sections in both disciplines report the specific results of the study, only 50 per cent of the Educational Technology comment on the specific results, whereas the same move is present in more than 80 per cent of the Results section of Applied Linguistics articles. However, most of the articles in both disciplines contain a *Preparing for the presentation of results* move, which normally occurs at the beginning of this section. Very few articles evaluate or summarize the results at the end of this section. In brief, the three moves *Preparing for the presentation of results, Reporting specific results* and *Commenting on specific results* seem to be prototypical moves in the Results section of articles in Applied Linguistics, whereas only the first two moves can be said to be typical moves of Educational Technology Results sections.

In preparing for the presentation of the Results section, most authors restate the data collection and analysis procedure. In commenting on specific results of the study, authors discuss or interpret the results more often than accounting for the results or comparing the results of their own study with previous findings. In fact, the latter strategies are used in less than half of the articles with a *Commenting on specific results* move in the Applied Linguistics corpus and hardly in any of the Educational Technology ones. This again shows that Educational Technology articles seem to be less elaborate than their Applied Linguistics counterpart. The most common moves and steps in the Results section are illustrated in the example below:

    <*Preparing for the presentation of the results section*>

        <Restating data collection and analysis procedure>

            To examine whether L1 reading attitude and L2 proficiency contribute to L2 reading attitude, multiple regression analyses were adopted …

    <*Reporting specific/individual results*>

        Correlations between two independent variables (L1 attitude variables and L2 proficiency) were all nonsignificant, and those between corresponding L1 and L2 reading attitude variables were all statistically significant …

    <*Commenting on specific results*>

        <Interpreting results>

            This preliminary correlation analysis suggested that (a) L1 and L2 reading attitudes are related, (b) L2 proficiency may not always relate to L2 reading attitude, …

[AL_TQ7]

## Move structure of the Discussion-Conclusions section of the main article

It is interesting to note that while the *Preparing for the presentation of results* move is a frequent move in the Results section, the same cannot be said of the *Preparing for the presentation of the discussion section* move in the Discussion-Conclusions section, especially for the Educational Technology discipline. Authors of the Educational Technology articles tend to start the section by highlighting some overall findings instead of preparing the readers for what the section is going to be about. The four most frequent things that authors in both disciplines do in this section are *Highlighting overall research outcome, Discussing the findings of the study, Deductions from the research* and *Evaluating the study*. Unlike the Results section where results tend to be reported without further comments, the *Discussing the findings* move is present in all the Discussion-Conclusions section of the articles in Educational Technology. Another interesting point is that whereas the results are seldom evaluated in the Results section, such evaluation is very common in the Discussion-Conclusions section although the evaluation is done at a more general level, that is, for the whole study. Like the *Preparing for the presentation of the discussion section* move, it is more likely for the authors in Applied Linguistics to draw conclusions of the study in this section than those in Educational Technology.

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[*] Note that only the findings from the articles with separate Results and Discussion sections are reported in this section and the next one. The findings from the five articles with a combined Results and Discussion section will be reported in last section of the findings.

In contrast to the *Preparing for the presentation of results* move in the Results section, the *Preparing for the presentation of the discussion section* move is more likely to refer to background knowledge than to restate the data collection or analysis procedure. Another striking difference between the Results section and the Discussion-Conclusions section is that the results reported in the former section are not frequently accounted for or compared to previous literature whereas all these strategies are commonly used to realize the *Discussing the findings of the study* move of the Discussion-Conclusions section. This is not surprising as this is the section where the findings are expected to be discussed in more detail. In evaluating the study, most authors discuss the limitations of their study rather than indicating the significance of their study. In drawing deductions from the research, authors often discuss the implications of the study and/or recommend further research. The following extract illustrates how the Discussion-Conclusions section is normally structured:

    *<Highlighting overall research outcome>*
        One interesting observation is that, in testing the structural model, attitude only demonstrated a weak direct effect on system usage …
    *<Discussing the findings of the study>*
        <Comparing results with literature>
        This is different from previous studies showing that attitude mediates the effect of perceived ease of use and perceived usefulness on the acceptance of a system …
        <Accounting for results>
        One of the possible explanations of the weak effect of attitude on system usage is that, in universities, students are told to use WebCT by their lecturers as a specific subject requirement …
    *<Evaluating the study>*
        <Indicating limitations>
        As with all empirical research, this study has a few limitations. First, the majority of the respondents in this study were full-time undergraduate students …
    *<Deductions from the research>*
        <Recommending further research>
        More research is needed to investigate others who are not in engaged in full-time undergraduate studies …
    [ET_CE1]

## Move structure of the Results-Discussion and Conclusions sections of articles with a combined section of Results and Discussion

As mentioned above, this section reports the move structure of the Results-Discussion and Conclusions sections of the only five articles in the whole corpus with a combined Results-Discussion section.

Interestingly, the three frequent moves of the Results section as reported in the above section were also found in the Results-Discussion section of all these five articles, namely *Preparing for the presentation of the Results/Discussion section, Reporting specific results,* and *Commenting on specific results*. Thus, at the move level, the structure of the Results-Discussion section seems to be similar to that of the Results section.

However, an analysis of the strategies used to realize the moves in such combined sections suggests that they are not exactly the same. Unlike the step structure of either the *Preparing for the presentation of the results section* move or the *Preparing to the presentation of the discussion section* move, this similar move in a combined Results-Discussion section makes use of all three strategies – *(Re)stating data collection and analysis procedure, Restating research questions or hypotheses,* and *Giving background knowledge*. In commenting on specific results, authors tend to interpret the results and accounting for the results, the former being more common than the latter.

Generally speaking, the move and step structure of the Conclusions section of these five articles follows closely the structure of the Discussion-Conclusions section as reported in the above section. Four moves occur frequently in this section of the five articles – *Highlighting overall research outcome, Discussing the findings of the study, Deductions from the research*, and *Evaluating the study*. The only significant difference between these two sections is in the step structure of the *DFS* move: only the *Interpreting / discussing results* step was found in the Conclusions section of all five articles, while only one article compared the results with the literature and one accounted for the results of the study.

It is therefore reasonable to group the combined Results-Discussion section with the Results section and the Conclusions section with the Discussion-Conclusions section.

## Conclusions

The prototypical functions and typical strategies to realize each function in research articles from the two disciplines can be summarized as follows:

*Table 1: Summary of the structure of Applied Linguistics and Educational Technology articles*

| Sections | Applied linguistics | Educational technology |
|---|---|---|
| Abstract | - Presenting the research<br>- Describing the methodology<br>- Summarizing the findings<br>- Discussing the research | - Presenting the research<br>- Describing the methodology<br>- Summarizing the findings<br>- Discussing the research |
| Introduction | - Establishing a territory<br> • Summarizing existing studies<br> • Drawing inferences from previous studies<br>- Establishing a niche<br> • Indicating a gap<br>- Presenting the present work<br> • Announcing present research descriptively and/or purposively<br> • Presenting research questions or hypotheses | - Establishing a territory<br> • Summarizing existing studies<br> • Drawing inferences from previous studies<br>- Establishing a niche<br> • Indicating a gap<br>- Presenting the present work<br> • Announcing present research descriptively and/or purposively<br> • Presenting research questions or hypotheses |
| Methods | - Describing data collection procedure<br> • Describing the sample<br> • Describing research instruments<br> • Recounting steps in data collection<br> • *Justifying the data collection procedure*<br>- Describing data analysis procedure<br> • Recounting data analysis procedure | - Describing data collection procedure<br> • Describing the sample<br> • Describing research instruments<br> • Recounting steps in data collection<br><br>- Describing data analysis procedure<br> • Recounting data analysis procedure |
| Results (or Results-Discussion) | - Preparing for the presentation of results<br> • (Re)stating data collection and analysis procedure<br>- Reporting specific / individual results<br>- *Commenting on specific results*<br> • *Interpreting results* | - Preparing for the presentation of results<br> • (Re)stating data collection and analysis procedure<br>- Reporting specific / individual results |
| Discussion-Conclusions (or Conclusions) | - *Preparing for the presentation of the discussion section*<br> • *Giving background knowledge*<br>- Highlighting overall research outcome<br>- Discussing the findings of the study<br> • Interpreting / discussing results<br> • Comparing results with literature<br> • Accounting for results<br>- *Drawing conclusions of the study / Stating research conclusions*<br>- Evaluating the study<br> • Indicating limitations<br>- Deductions from the research<br> • Making suggestions / drawing implications<br> • Recommending further research | <br><br>- Highlighting overall research outcome<br>- Discussing the findings of the study<br> • Interpreting / discussing results<br> • Comparing results with literature<br> • Accounting for results<br><br><br>- Evaluating the study<br> • Indicating limitations<br>- Deductions from the research<br> • Making suggestions / drawing implications<br> • Recommending further research |

It can be seen from the summary table above that the structures of the papers from the two disciplines are quite similar to each other. This is perhaps due to the fact that they are all empirical articles and the two disciplines are related to each other – they are both interdisciplinary in the broad field of teaching and learning. However, Applied Linguistics belongs more to the field of Social Sciences and Humanities, while Educational Technology is more associated with Natural Sciences, for this particular corpus, Computer Science. It is perhaps due to this difference that there are still some differences in the organization of papers between the two disciplines. Applied Linguistics papers seem to be more elaborate than Educational Technology papers in that they do not simply recount the data collection procedure but frequently give justifications for the procedure as well in the Methods

section. Similarly, in the Results section, authors of Applied Linguistics articles do not only report the findings of the study but also comment on the results. For the Discussion-Conclusions section, they are more likely to give some background information at the beginning of the section and explicitly state the conclusions of their study.

It should be noted, however, that the moves and steps in each section as shown in Table 1 above do not occur in a linear sequence, but one move can occur more than once and every time it is used, it can be realized by different strategies. The table above only lists the most commonly used (or prototypical) moves and strategies in the corpus.

The present study is significant in a number of ways. It shows that move structure of the research article may vary across related disciplines. Thus, in writing a paper for a journal in a particular discipline, it is important to notice how a paper is structured in that discipline. Pedagogically, this study aims to provide non-native English-speaking writers with a complete view of how they can structure a research article in Applied Linguistics and Educational Technology from the Abstract through to the Conclusions of the paper. This study does not simply inform the readers that their papers should have an Abstract, an Introduction section, a Methods section, a Results section and a Discussion-Conclusions section, but give them the structure of each section based on the authentic data from the corpus – the real papers that have been accepted and published in the fields. The structure of each section is not only presented in general terms, i.e. what the main moves (or textual functions) are included in each section), but how they can be realized, i.e. what strategies they can use to express each main function. Such information is rarely included in writers' manuals or writing handbooks. And if it is mentioned, it is normally generalized across various disciplines. Yet, as we can see from the findings of this study, articles in different disciplines are not always structured in the same way.

The findings of the present study will generally benefit postgraduate students in the areas of Applied Linguistics and Educational Technology and non-native English researchers around the world in making their research articles more acceptable for publication. This study also provides a valuable resource for teachers of English for Academic Purposes or English for Specific Purposes. Students can use the basic framework provided in this study to generate their own paper, to make sure that their writing follows the conventions in their disciplines and are thus more likely to have their papers accepted by international English-medium scholarly journals.

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